

Description of a new *Sesia* clearwing moth injuring poplar street trees in Lhasa, Tibet (Lepidoptera, Sesiidae)

Yutaka ARITA¹⁾, Zhen-Guo XU²⁾ and You-Qiao LIU³⁾

¹⁾ Zoological Laboratory, Faculty of Agriculture, Meijo University, Tempaku-ku, Nagoya, 468 Japan

²⁾ Qinghai Academy of Agriculture and Forestry, Xining, Qinghai, 810016 P. R. China

³⁾ Institute of Zoology, Academia Sinica, Beijing, 100080 P. R. China

Abstract *Sesia tibetensis* Arita and Xu, new species, was discovered from poplar street trees, *Populus alba*, in Lhasa, Tibet. The new species is described, illustrated, and compared with a similar species *S. siningensis* (Hsu). These two species differ in genital morphology in both sexes, and larval and pupal behavior.

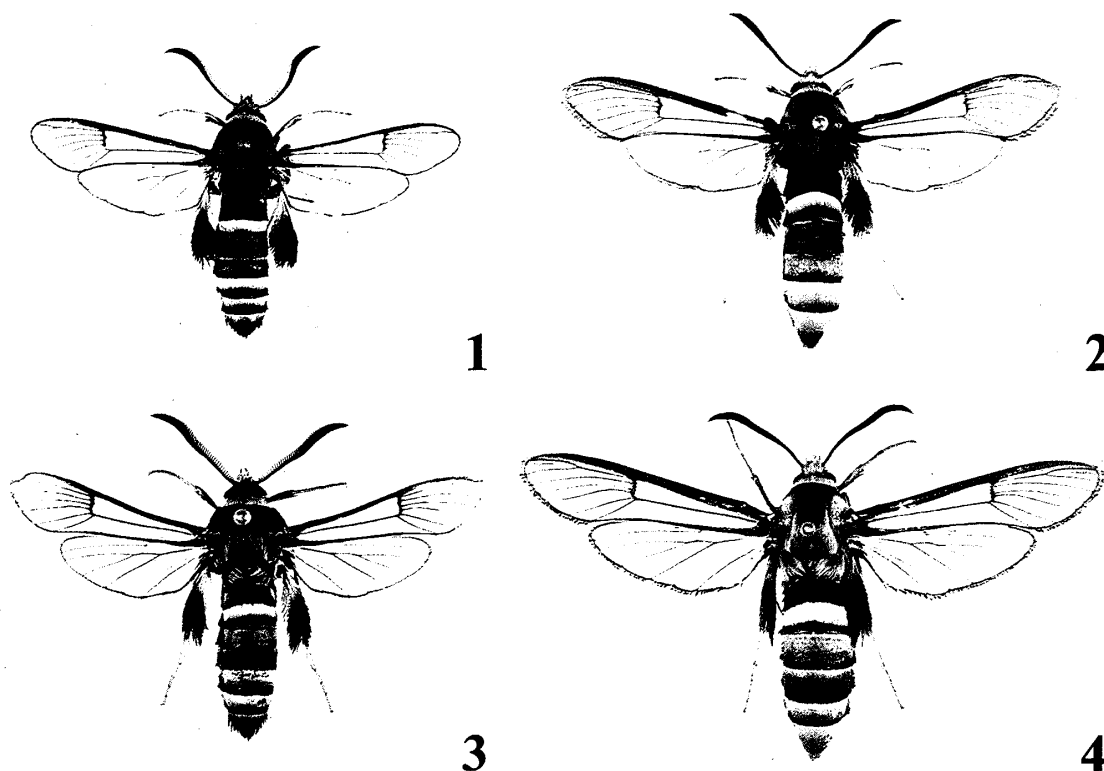
Key words Lepidoptera, Sesiidae, *Sesia tibetensis* sp. n., *Sesia siningensis* (Hsu), hostplant, *Populus alba*, early stages, Tibet.

During our field survey of poplar trunk clearwing borers in China, we discovered a clearwing moth belonging to the genus *Sesia* from the trunk of a poplar tree, *Populus alba*, lining the streets in the high altitude (3,650 m) city of Lhasa, Tibet. The new species is close to *Sesia siningensis* (Hsu, 1981) and is compared and described below.

***Sesia tibetensis* Arita and Xu, sp. n.** (Figs 1-2, 5-9, 10a, 11a, 12a, 13, 14a, 15, 17-18)

♂. Alar expanse 29-38 mm. Head with vertex having blackish brown, hair-like scales; frons dark grey with broad white stripe laterally. Occipital fringes whitish yellow. Antenna dark fuscous, apical 1/3 reddish brown; ventral side reddish brown. Labial palpus vivid yellow. Thorax dark fuscous; patagial collar golden yellow; tegula blackish fuscous, brown at middle. Forewing hyaline, costal and dorsal margins, veins and discal spot dark fuscous; base of wing blackish; base of costal margin with a brown spot; cilia dark fuscous. Hindwing hyaline, veins and very narrow outer margin dark fuscous; cilia dark fuscous. Foreleg: coxa dark fuscous; femur yellow dorsally, dark fuscous ventrally; tibia and tarsus yellowish to brown mixed with blackish scales. Midleg: coxa dark fuscous; femur dorsal half yellow, ventral half dark fuscous; tibia brown mixed with blackish scales; tarsus yellowish brown. Hindleg: coxa dark fuscous; femur dorsal half yellow, ventral half dark fuscous; tibia ventral side brown mixed with dark fuscous scales, white at middle; tibial tufts dorsobasally 1/3 yellow, posterior 2/3 blackish with brown outer margin; tarsus yellow. Abdomen tergite, basal and 2nd segments black, 3rd, 6th and 7th with broad golden yellow anterior band, 4th black sparsely mixed with brown scales on middle, 5th black with anterior 2/3 densely mixed with brown and yellow scales; terminal segment anterior margin with golden yellow band, others brown with orange tipped scales, blackish on middle; sternite black, 3rd-7th with yellow broad anterior bands, terminal segment yellow with orange-tipped scales.

♀. Alar expanse 37-45.5 mm. Forewing costal margin much broader than that of male. Abdomen tergite 5th with very broad brown band mixed with yellow scales and its apical margin yellow, 6th with very broad yellow band, terminal segment with very broad yellow band and apical part dark fuscous with orange-tipped scales.



Figs 1-4. Adults of *Sesia* species. 1. *Sesia tibetensis* sp. n., ♂, paratype. 2. *Ditto*, ♀, paratype. 3. *S. sinigensis* (Hsu, 1981), ♂. 4. *Ditto*, ♀.

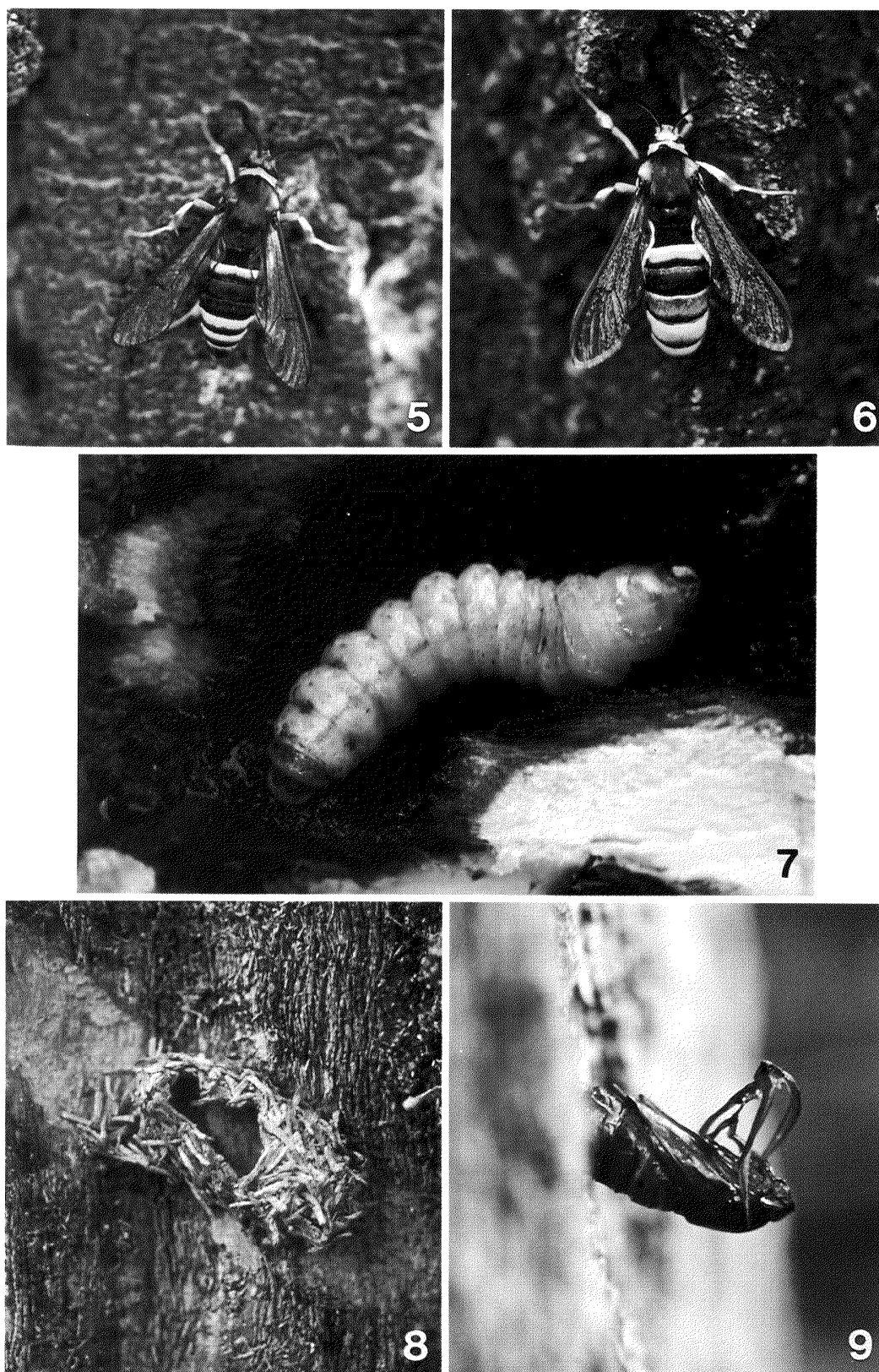
Variation. One male in type series varies in maculation. The abdomen tergite 6th, 7th and terminal segments lack a broad golden yellow anterior band.

Male genitalia (Figs 10a, 11a, 12a, 13, 14a). Uncus moderately long, apex densely clothed with short setae ventrally. Tegumen long, slender. Gnathos well sclerotized, long, apex pointed. Vinculum long. Saccus moderately long, clavate. Valva longer than wide, broad; dorsal margin almost straight; apical margin strongly projected at middle, densely clothed with long setae along dorsoapical corner to 3/4 of apical margin; ventroapical corner rounded; a lobe with sparsely long hairs; three long spine-like bristles ventrobasally. Aedeagus long, vesica with a long row of thorns; coecum pennis bifid and roundish.

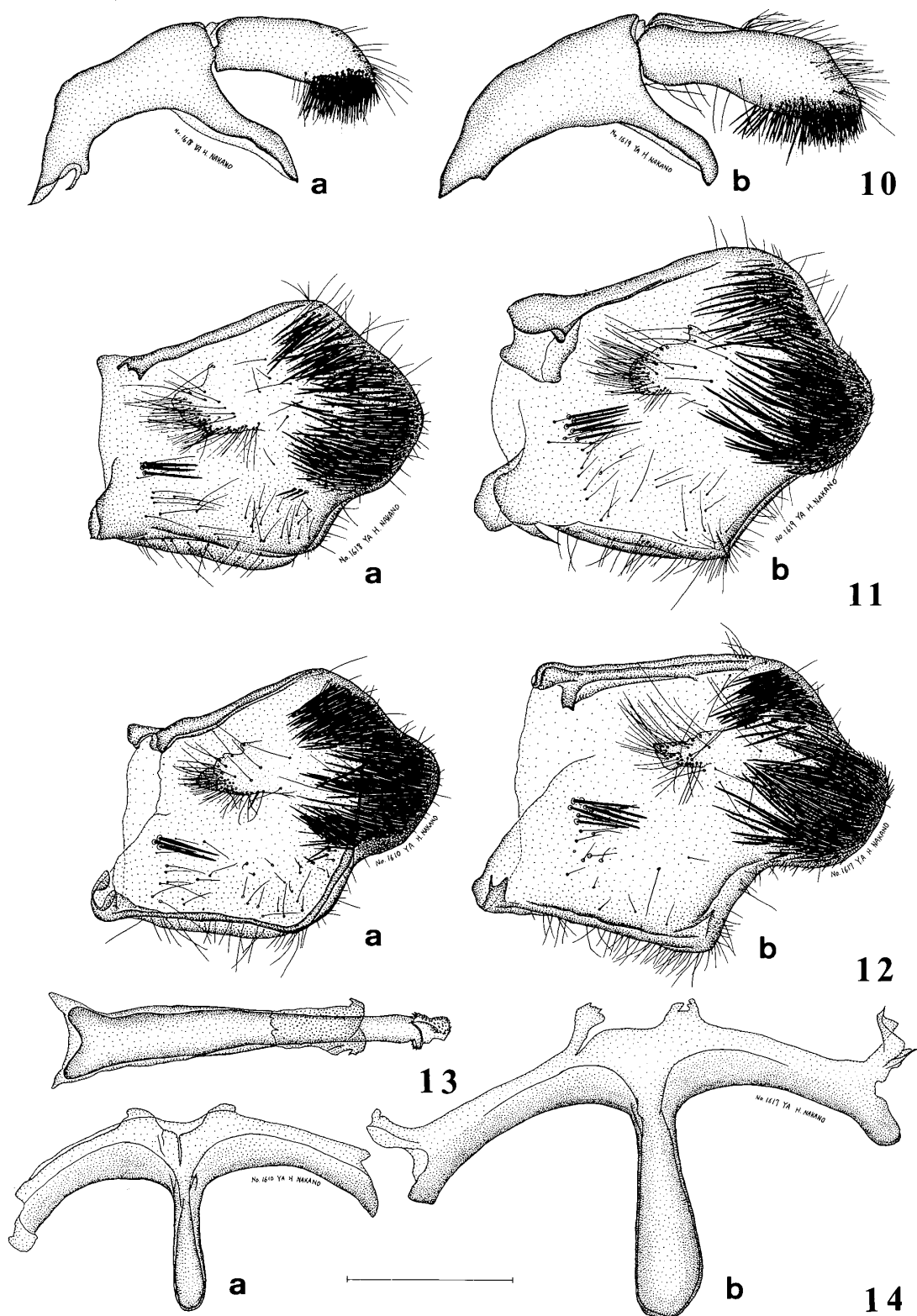
Female genitalia (Fig. 15). Papilla analis comparatively large. Postapophysis remarkably long. Antapophysis short. Ostium bursae large, oblong, its posterior margin widely thickened. Antrum very short. Ductus bursae short, broad. Corpus bursae broadly oblong; signum fairly small, rounded.

Holotype ♂, Lhasa (3,650 m), Tibet, 22. VIII. 1993, ex *Populus alba*, Y. Arita legit. Paratypes: 9 ♂ 15 ♀, with same data as holotype except 21-24. VIII. 1993. The holotype and four male and four female paratypes will be deposited in the Institute of Zoology, Academia Sinica, Beijing. The other paratypes are deposited in the Zoological Laboratory, Faculty of Agriculture, Meijo University, Nagoya, Japan.

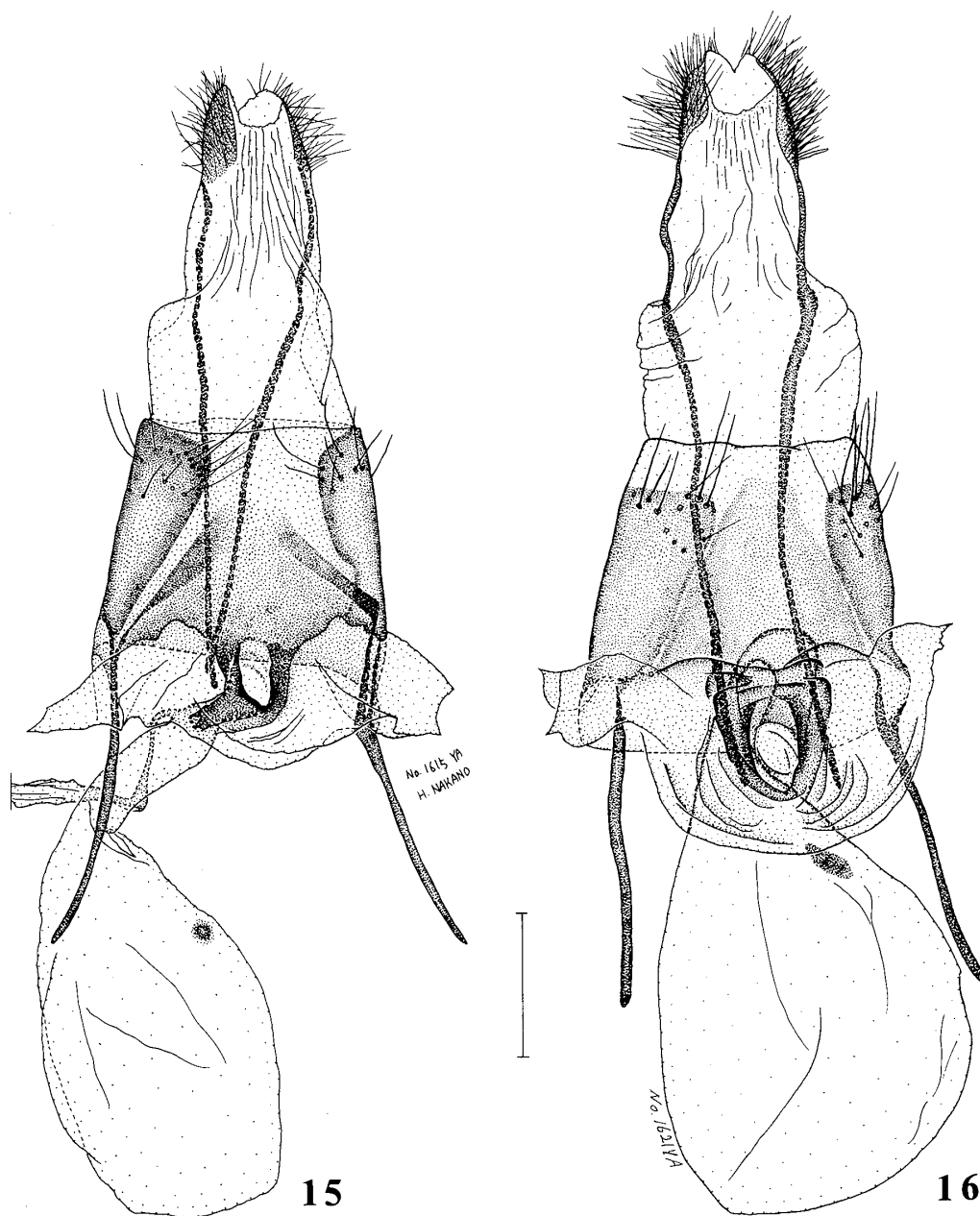
Mature larva. Length 29-42 mm. The larva of *S. tibetensis* is superficially similar to that of *S. sinigensis* (Arita *et al.*, 1994), and is not separable by external morphological characters, but the body length is comparatively shorter than that of *S. sinigensis*.



Figs 5-9. *Sesia tibetensis* sp. n., hostplant, *Populus alba*. 5. Freshly emerged male on trunk of hostplant. 6. *Ditto*, female. 7. Mature larva in gallery, exposed. 8. Cocoon in larval gallery, exposed. 9. Extruded pupal case from trunk of hostplant.



Figs 10–14. Male genitalia of *Sesia* species (a: *Sesia tibetensis* sp. n., b: *S. siningensis* (Hsu, 1981)). 10. Uncus and tegumen, lateral aspect. 11. Right valva, natural condition. 12. *Ditto*, depressed condition. 13. Aedeagus of *Sesia tibetensis* sp. n. 14. Saccus, ventral aspect. Scale line=1.0 mm.

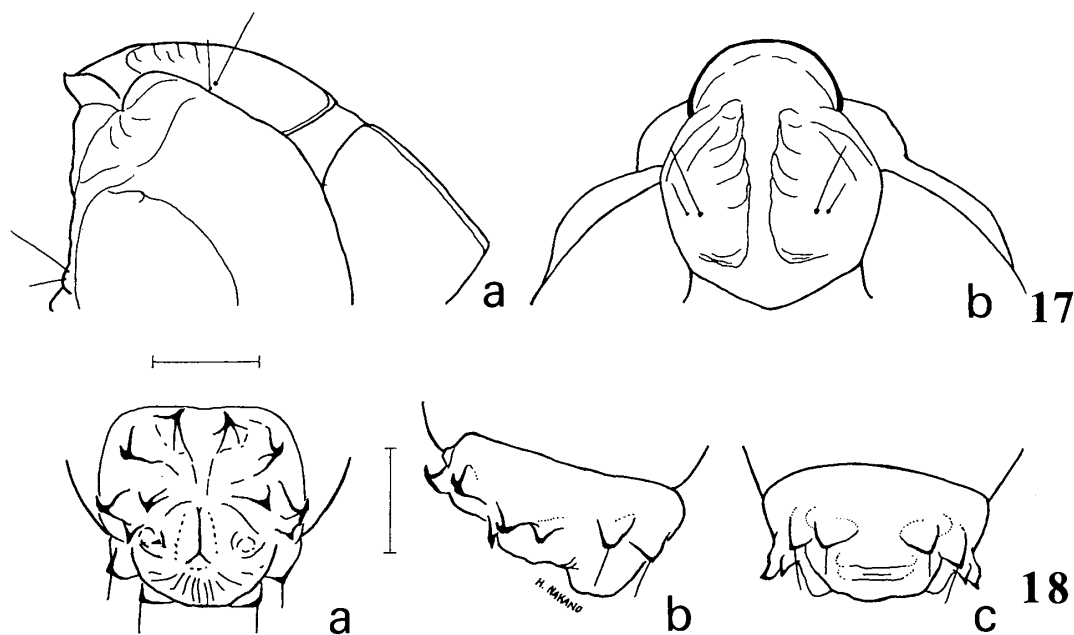


Figs 15-16. Female genitalia of *Sesia* species. 15. *Sesia tibetensis* sp. n. 16. *S. siningensis* (Hsu, 1981). Scale line=1.0 mm.

Material examined. 22 exs, feeding in gallery of *Populus alba*, Lhasa (3,650 m), Tibet, 22. VIII. 1993, Y. Arita legit.

Pupa. Length 11-18 mm. Width 5-6.5 mm. The shape of pupae of *S. tibetensis* is very similar to that of *S. siningensis* (cf. Arita *et al.*, 1994) except for the shape of frontal process and number and arrangement of spines of 10th abdominal segment.

Frontal process (Figs 17a-b) large, stout, rounded in lateral view; acutely pointed anteriorly. Tenth abdominal segment (Figs 18a-c) with seven pairs of spines: one pair on dorsal side, three pairs on lateral side, ventral two of them connected together, three pairs on ventral side.



Figs 17-18. *Sesia tibetensis* sp. n., pupa, male. 17. Frontal process (a: lateral view; b: dorsal view). 18. Spines of tenth abdominal segment (a: ventral view; b: lateral view; c: dorsal view). Scale line=1.0 mm.

Material examined. 4 exs, ex cocoon in larval gallery of *Populus alba*, Lhasa (3,650 m), Tibet, 22. VIII. 1993, Y. Arita legit.

Bionomics. The life cycle is poorly known. The larvae bore an irregular gallery between bark and wood on the trunk and surface of roots. Pupation takes place in cocoon (only one example, 28 mm long and 13 mm wide) in larval gallery. Adults emerge in the morning from pupal extruding from the emergence hole of the trunk or surface of ground very close to the trunk of hostplant.

Table 1. Differences between *S. tibetensis* sp. n. and *S. siningesis* (Hsu, 1981).

	<i>tibetensis</i>	<i>siningesis</i>
Basal segment of labial palpus	vivid yellow	brown
base of costal margin of forewing	with a brown spot	with a yellow spot
subterminal streaks on thorax	no	yes
long setaceous scales on lateral posterior margin of metathorax	dark fuscous	yellow
foreleg coxa	dark fuscous	light brown
mid- and hind coxae	dark fuscous	light yellow
abdomen tergite 2nd & 4th	2nd entirely black & 4th black, sparsely mixed with brown scales on middle	2nd brownish & 4th reddish brown

Hostplant. *Populus alba* Linnaeus (Salicaceae).

Remarks. The new species of poplar trunk clearwing borer is similar to *S. siningensis*, even in the male genitalia, but easily separable from it by the following points: wing expanse comparatively shorter, ♂ 29-38 mm and ♀ 37-45.5 mm, instead of ♂ 35-42 mm and ♀ 43-50 mm; the other differences between these two species are as outlined in Table 1. It is important to note that the identification of species can be made by the differences in larval behavior. The larvae of *S. tibetensis* live in a gallery between bark and wood, but the larvae of *S. siningensis* bore 14-20 cm in solid wood vertically (Arita *et al.*, 1994).

Acknowledgements

Our hearty thanks go to Mr Bao-Hai Wang, Agricultural Institute of Tibet Autonomous Region, Lhasa, for his kind help during surveying in Lhasa. We cordially thank Dr Thomas D. Eichlin, Department of Food & Agriculture, California, for the review of our manuscript. We are also greatly indebted to Mr Y. Araki, the president and Mr M. Nagai, the head of the Nagoya Office, both of the Natural Environment Co., Ltd., Osaka, for their generous aid to our clearwing moth survey in China.

Reference

Arita, Y., Xu, Z.-G. and Y.-Q. Liu, 1994. Descriptions of immature stages of *Sesia siningensis* (Hsu) (Lepidoptera: Sesiidae). *Trans. Shikoku ent. Soc.* **20**: 117-123.

摘 要

チベット・ラサの街路樹のポプラを加害する *Sesia* 属の 1 新種 (鱗翅目, スカシバガ科) (有田豊・徐振国・刘友樵)

チベット・ラサ市内に街路樹として植栽されているウラジロハコヤナギ (*Populus alba*) から羽化したスカシバガの一種 *Sesia tibetensis* を新種として記載した。この新種は中国青海省西寧から記載された *Sesia siningensis* (Hsu, 1981) に非常によく似ているが、本新種のほうが小型で、Table 1 にあるように labial palpus の第一節、前翅前縁基部の spot、後胸後縁部の長毛、前・中・後脚などの色彩が異なる。また幼虫は樹皮下を加害しそこで繭を作り蛹化するのに対して、*S. siningensis* では木部に上下にトンネルを作るなど幼虫の生態にかなりの違いが見られる。

(Accepted July 1, 1994)